

## Household Knowledge, Attitudes and Practices in Solid Waste Segregation and Management: A study in Eravur Urban Council area, Batticaloa district

Krishnal Thirumarpan<sup>1</sup>, T.Thiruchelvam<sup>2</sup>, M.S.A.Dilsath<sup>1</sup> and M. S. M.Minhajkhan<sup>1</sup>

<sup>1</sup> Department of Agricultural Economics, Faculty of Agriculture  
Eastern University, Vantharumoolai, Sri Lanka

<sup>2</sup> Department of Bio System Technology, Faculty of Agriculture  
Eastern University, Vantharumoolai, Sri Lanka

<sup>1</sup> [skrish\\_16@yahoo.com](mailto:skrish_16@yahoo.com) and <sup>2</sup> [thiru3@sky.com](mailto:thiru3@sky.com)

**ABSTRACT:** Solid waste has become a critical issue with increasing population creating a negative impact on environment. This study examined the knowledge, attitudes and practices in solid waste segregation and management in Eravur Urban Council. Proportionate sampling was done and from five Grama Niladhari divisions a total of 100 households were studied. It was found that average quantity of solid waste generated by households was 2.61 kg/day. Food wastes topped the list where every household generated 2.06kg of food waste per day. Food wastes were disposed by several methods such as disposal in urban council truck (30.35%), fed to animals (29.46%) and buried in their home (25.89%). Yard wastes, plastics, paper, metals and glass wastes were mostly disposed by households through the existing Urban Council collection service. Only 0.93% of the household reused the paper. Eravur-01B households generated the highest average quantity (3.17kg/ household /day) of solid waste among all five GN divisions in the Eravur Urban Council. It was also found that 82% of the household heads believed that the burning of waste makes health risk. 98% of the household heads concerned about disease (Eg: Dengue, Malaria) that were related to improper storage and disposal method of waste. About 84% of the household were concerned about the service that provided by Urban Council. Public education and teaching in school about waste management took the big responsibility to control the waste blooming in Eravur Urban Council area. 18% of the household heads were not worried about the waste disposal because of their personal issues like unemployment and high cost of living etc. It is recommended that the households must be educated with proper solid waste management practices and the government must intensify its proper solid waste management education to increase the awareness and knowledge level of households on the collection service.

**Keywords:** Solid waste, disposal practices

### 1. INTRODUCTION

With the advent of increase in the world population and demand for food and other necessities, waste generated also started to increase drastically. According to Praktiri (2007), the amount of waste generated daily by each household started to rise and the municipal waste collection centres cannot handle the volume of wastes collected anymore. This inefficiencies and mismanagement causes serious impacts on health and problems to the surrounding environment.

Municipal solid waste is an increasing problem in urban areas of Sri Lanka and this problem is aggravated due to absence of proper solid waste management systems at local authorities (Central Environment Authority, 2005). A study conducted by Perera (2003) indicated that approximately 80-85% of municipal domestic solid waste produced in Sri Lanka consists of organic waste, including food and garden

waste. The balance, 15%-20% consists of paper, plastics, glass, metals and other inorganic materials.

According to Gunawardana, *et al.*,(2009), although haphazard solid waste disposal has been identified to be one of the major causes for environmental degradation in the National Action Plan of Sri Lanka, the most common method of municipal solid waste disposal still remains to be open dumping, leading to many environmental and health problems.

According to the Eravur Urban Council Report (2014), an estimated 20 metric tons of solid waste is being generated in the Urban Council area every day. Most of the solid waste is from Eravur-01B GN area because of higher population density compare to other GN division of Eravur urban council. The amount of solid waste generated per individual ranges between 0.50kg and 0.625 kg daily (Eravur Urban Council Report, 2014). High population and the associated increase in urbanization and economic activities had made the impact of the society's solid waste very noticeable. The problems are lack of disposal site and lack of financial assistance compared to solid waste generation in Eravur Urban Council. During the flooding time waste had been carried out into lagoon and it was dug out by animals and birds which were spread all over the area.

Thus, a detailed evaluation and quantification of the burdens resulting from current municipal solid waste management on the environment and society is required to develop a sustainable municipal solid waste management system in Eravur Urban Council. With this the following objectives were identified.

1. To find out the socio economic profile of the households
2. To estimate the different types of solid waste generated
3. To determine the solid waste disposal practices
4. To determine the level of awareness of the households on proper household solid waste management

## **2. METHODOLOGY**

Eravur Urban Council comes under the Eravur Town Divisional Secretariat division. This study was conducted in 5 GN divisions of Eravur Urban Council area in Batticaloa district which were Eravur-03A, Eravur-03, Eravur-02C, Eravur-02A, Eravur - 01B. Proportionate sampling was done and the final sample comprised of 100 household. They were interviewed at their door step.

### **2.1 Data collection and analysis**

Primary and secondary data were used in the study. Primary data were taken from personal interviews using a questionnaire. Data collected included the socio and economic characteristics of the household head, different types of solid waste generated, their solid waste disposal practices, and their solid waste management attitude. Secondary data were obtained from the Eravur Urban Council and Divisional Secretariat (Eravur Town).

Descriptive statistics and frequency analysis were done for questionnaire to explore the socio economic status of household.

### 3. RESULTS AND DISCUSSION

The mean age of household heads were 42.63 years. Results also indicated that most of the household heads were educated up to secondary level (55%) and only 35% were not educated. Mean household income was Rs 34,440 per month. The average household expenditure was Rs 32,850 per month.

*Table 1. Household level information*

Household Information	Mean	Std. Deviation
Household income (Rs/month)	34440	15147.97
Household expenditure (Rs/month)	32850	8906.5
Size of household (Number of person)	4.22	1.3
Number of employed people (Number of person)	1.31	0.54

#### 3.1 Type and volume of solid waste generated

Food wastes topped the list of solid waste materials and it was seen in almost all households (100%) (Table 2). This was followed by paper/card board products, yard wastes, other, glass materials, plastics and metals.

The average quantity of solid waste generated by households was 2.61 kg/day. The average solid waste load of the municipality was 20,000 kg (Eravur Urban Council, 2014).

*Table 2. Type of solid waste generated*

Type of Waste	Total Household (N=100) Percentage
Food Wastes	100
Yard Trimming	41
Paper/Card board	63
Plastic	16
Metals	14
Glass	22
Others	38

Based on the results, every household generated 2.06 kg of food waste per day and food waste contributed nearly 79% of the total waste generated in the study area. Whereas plastic waste generation was very much lower (0.05 kg/day) than all other types of waste in the study area.

*Table 3. Residential solid waste generation in the Eravur area of Batticaloa*

Types of Waste	Mean waste generation/ Household/ day (kg)	95% Confidence limits		Composition of different types of waste to total waste (%)
		Lower	Upper	
Food Wastes	2.06 (1.23)	1.82	2.3	78.94
Yard Trimming	0.13 (0.21)	0.08	0.17	4.98
Paper/Card board	0.08 (0.09)	0.07	0.1	3.06
Plastic	0.05 (0.13)	0.02	0.07	1.92
Metals	0.08 (0.24)	0.04	0.13	3.06
Glass	0.08 (0.17)	0.05	0.12	3.06
Other	0.13 (0.2)	0.09	0.17	4.98
Total	2.61			100

(Within brackets Std. Deviation values)

### 3.2 Average quantity of solid waste generated by households per GN division

Households' average quantity of solid waste generated per GN division was also computed and shown in Table 4. Households in Eravur 01B generated the highest average quantity (3.17kg) of solid waste among all five GN divisions in the Eravur Urban Council. This may be due to the fact that, the market is located in this GN division and due to high population density of that GN division.

*Table 4. Average quantity of solid waste generated by households per GN division*

GN Division	Quantity of Solid Waste generated (Kg/HH/day)
Eravur-03A	1.94
Eravur-03	3.12
Eravur-02C	2.36
Eravur-02A	2.7
Eravur-01B	3.17

### 3.3 Household solid waste disposal practices

Households' solid waste disposal methods were also examined and is shown in Table 5. Food wastes were disposed by households by several methods such as disposal in urban council truck (30.35%), fed to animals (29.46%) and buried in their home (25.89%). Yard wastes, plastics, paper, metals and glass wastes were mostly disposed by households through the existing urban council collection service. Meanwhile, metals and plastic were sold by some of the households (34.31% and 4.9% respectively) and only 0.93% of the household reused the paper.

*Table 5. Household solid waste disposal practices*

Types of Waste and Methods of Waste Disposal	Percentage
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<b>Food waste</b>	
Bury	25.89
Dump in yard	3.57
Dump on road	10.71
Urban council truck	30.35
Feed to animal	29.46
<b>Yard trimmings</b>	
Burn	2.8
Bury	10.28
Dump in yard	3.73
Dump on road	7.47
Urban council truck	75.7
<b>Paper/cardboard</b>	
Burn	13.08
Bury	11.21
Dump in yard	1.86
Dump on road	1.86
Urban council truck	71.02
Reuse	0.93
<b>Plastic</b>	
Burn	0.98
Bury	3.92
Dump in yard	1.96
Dump on road	1.96
Urban council truck	86.27
Sell	4.9
<b>Metals</b>	
Urban council truck	65.7
Sell	34.3
<b>Glass</b>	
Dump in yard	1
Urban council truck	99
<b>Others</b>	
Burn	1.96
Bury	3.92
Dump in yard	1.96
Urban council truck	92.15
(Multiple Response)	

### 3.4 Household opinion of the Urban Council collection service

Most of the households (43%) were very satisfied with existing collection service of the urban council, whereas 5% of the households don't have any idea about the urban Council collection services.

*Table 6. Household opinion of the Urban Council collection service*

Household Opinion	Percentage
Very satisfied	43
Reasonably satisfied	27
Not satisfied at all	25

Don't know	5
Total	100

### 3.5 Concerns about solid waste management

*Table 7. Household concerns about solid waste management*

Concerns about solid waste management	Total Household (N=100)		
	Concerned (%)	Not concerned (%)	No opinion(%)
How concerned are you about health risks related to burning waste?	82	17	1
How concerned are you about illegal dumps polluting rivers, streams, and wells?	44	49	7
How concerned are you about diseases that are related to improper storage and disposal methods, like Dengue, malaria?	98	2	0
How concerned are you about flooding due to waste blocking drains and gullies?	57	40	3
How concerned are you about the reduction of natural resources that are used to make the products we buy and use (such as, oil for plastic bottles and trees for paper)?	36	37	27
How concerned are you about the service provided by the urban council in this area?	84	15	1
How concerned are you about litter in this area?	60	31	9
How concerned are you about illegal dumping in this area?	32	57	11
How concerned are you about the presence of rats in this area?	15	74	11
How concerned are you about waste in Eravur urban council area?	36	52	12

Household concerns about solid waste management were also examined as shown in Table 7. Results revealed that 82% of the household heads believed that the burning of waste makes health risk. 98% of the household heads concerned about disease (Eg: Dengue, Malaria) that were related to improper storage and disposal method of waste. About 84% of the household were concerned about the service that provided by urban council. 57% of the household were not concerned about the illegal dumping in their area and also 57% of the household were concerned about flooding due to waste blocking drains and gullies.

### 3.6 Solid Waste Management Attitude Scale

Table 8. Solid waste management attitude scale

Waste management attitude	Agree (%)	Disagree (%)	No opinion (%)
I play an important role in the management of waste in my community.	86	8	6
I <b>don't</b> care that burning waste can be bad for my health and the health of others.	6	84	10
People throw waste on the streets and in the drains and gullies because they have no other means of getting rid of (disposing of) their waste.	24	46	30
The urban council is not doing enough to fix the waste problem.	30	46	24
Correct waste management should be taught in schools.	100	0	0
Other personal issues (like unemployment, and cost of living) are more important to me than a waste-free community.	18	36	46
Regular collection of waste is the only solution to the waste problem.	92	2	6
Picking up waste around my community is my responsibility.	74	16	10
Public education about proper waste management is <b>one way</b> to fix the waste crisis.	88	1	11
It is <b>very</b> important that the Eravur Town urban council put recycling laws and programs in place.	47	1	52

In the study area households accepted that they have the high responsibility and willingness to regular collection process. Based on these results, public education and teaching in school about waste management took the big responsibility to control the waste blooming in Eravur Urban Council area. 18% of the household heads were not worried about the waste disposal because of their personal issues like unemployment and high cost of living etc.

## 4. CONCLUSION

The study focused on the level of awareness and attitudes on different types of solid waste generated and disposal methods in Eravur Urban Council area. Proportionate sampling was done and from five Grama Niladhari divisions a total of 100 households were studied. Results revealed that the average quantity of solid waste generated by households was 2.61 kg/day. Food wastes topped the list of solid waste materials and found almost all households (100%). This was followed by paper/card board products, yard wastes, other, glass materials, plastics and metals. Every household generates 2.06 kg of food waste per day and food waste contributes nearly 79% of the total waste generated in the household. whereas plastic waste generation was very much lower (0.05 kg/day) than all other types of

waste. Eravur-01B households generated the highest average quantity (3.17kg/household /day) of solid waste among all five GN divisions in the Eravur Urban Council.

Food wastes were disposed by households by several methods that were disposed in urban council track (30.35%), fed to animals (29.46%) and buried in their home (25.89%). Yard wastes, plastics, paper, metals and glass wastes were mostly disposed by households through the existing urban council collection service. Meanwhile, metals (34.31%) and plastic (4.9%) were sold by some of the households and only 0.93% of the household reused the paper.

It is recommended that the households must be educated with proper solid waste management practices. The government must intensify its proper solid waste management education to increase the awareness and knowledge level of households on the collection service.

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